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yea, and the care of it sometimes loseth or disturbeth the victory."

Students who are drifting on the sea of facts with which the modern laboratory has flooded us declare that the doctrine of adaptation is antiquated and unscientific and pernicious.

They tell us organisms have many properties which are not adaptive, and that in many other cases we cannot tell whether a property is adaptive or not. Of course this is true. No one supposes that susceptibility to poisons, for example, is adaptive, and our knowledge of nature is incomplete beyond measure.

They tell us, too, that many attempts to explain the uses of parts are fanciful and worthless. Unfortunately, this is true also, but the logic which makes it a basis for denying the reality of adaptation is enough to call Paley from his grave.

While protoplasm is the physical basis of life, the intellectual basis of biology is adjustment.

I should like to see hung on the walls of every laboratory Herbert Spencer's definition to the effect that life is not protoplasm but adjustment, or the older teaching of the Father of Zoölogy that the essence of a living thing is not what it is made of nor what it does, but why it does it.

Spencer has given us diagrams to prove that the vertebral column has become segmented by the strain of flexion, but Aristotle tells us that Empedocles and the ancients are in error in their attempts to account for the jointing of the backbone by the strain of flexion, for the thing to explain, he says, is not how it becomes jointed, but how the jointed backbone has become so beautifully adjusted to the conditions of life.

"Is there anything of which it may be said: See, this is new. It hath been already in the old times which were before us."

W. K. BROOKS.

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# CURRENT NOTES ON ANTHROPOLOGY (III).

## THE EARLIEST ENGLISHMEN.

SOME interesting studies as to the earliest signs of human industry in England deserve a notice.

The description by Professor Prestwich of some flint implements found by Mr. Harrison in pre-glacial strata on the chalk plateau of Kent seems to have added an impetus to such researches. Mr. O. A. Shrubsole describes a series of those relics from pre-glacial hill gravels in Berkshire, in the *Journal of the Anthropological Institute* for August, 1894; and in the May number of the same journal, Mr. A. M. Bell replies with considerable force to the objections which had been urged against Professor Prestwich's reasonings; vindicating for the Kent implements an antiquity beyond that of the formation of the present river valleys.

A pleasantly written volume on the subject is one by Mr. Worthington G. Smith entitled, *Man the Primeval Savage*. He discovered a true palaeolithic workshop, or rather several of them, in undisturbed relations, near Dunstable, about thirty miles north of London. The heaps of chips and broken flints lay just as the primeval artist had left them, covered to many feet in depth by the washings from the boulder clay. Mr. Smith was able to collect the chips in a number of instances, and by fitting them together, reconstruct the original flint block from which the instrument had been formed; and then to make a cast of the size and shape of the tool represented by the cavity. This beautiful demonstration leaves nothing to be desired. He does not believe, however, that either his finds or those of the others mentioned are pre-glacial. His book is agreeably written and well illustrated. (Published by E. Stanford, London.)

## THE TRIBES OF THE 'GRAN CHACO.'

THE 'Gran Chaco,' or 'Great Hunting-ground,' merits its name, for it extends 850

miles in length by 350 in breadth, one vast forest and marsh, in the northern portion of the Argentine Republic. Much of it is unexplored and almost inaccessible. Its sparse human inhabitants are savage and wandering tribes, still in the stone age, shy and treacherous. Their linguistic classification presents extraordinary difficulties. Explorers have extended the same name to different stocks; and applied diverse names to the same stock.

An excellent monograph published in the *Atti Della Società Romana di Antropologia* by Guido Boggiani is helpful as far as it goes. It is entitled '*I Ciamacoco*.' This is another form of *Zamuco*, the name of a tribe converted in the last century by the missionaries. But the modern is not a descendant of the ancient clan, scarcely any linguistic relative. The author presents an accurate vocabulary of about 250 words, and gives a full description of the primitive arts of the tribe, with 62 beautifully prepared illustrations. They still use the stone axe, the bow and arrow, feather and shell decorations, and other appurtenances of the pristine condition of culture.

Another band, the Chunupies, of the southern Chaco, is the subject of an article by J. B. Ambrosetti, in the *Anales de la Sociedad Científica Argentina* for 1894. He gives a short vocabulary and an ethnographic description.

Such work cannot be accomplished too soon, as these Chaco tribes are dying out with fearful rapidity, and probably half a century more will complete their extermination.

#### ARCHÆOLOGY AS A DEDUCTIVE SCIENCE.

WITHIN the last two years an interesting issue has arisen between two schools of archæologists, the one which *knows* just what man's early activities yielded, the other which prefers to learn about them by studying what relics can be found, and con-

fining conclusions to their obvious teachings.

In America the former school is ably represented by Mr. W. H. Holmes and Mr. J. D. McGuire, of Washington. Mr. Holmes' lines of thought are fully set forth in the *Proceedings of the Chicago Congress of Anthropology*, in an article entitled *Natural History of Flaked Stone Implements*. He maintains that an implement is to be studied 'as the biologist studies the living creature;' and he therefore classifies such remains into 'species' and 'genera,' speaks of their 'lines of evolution,' and even of their 'ancestral forms,' and adds diagrams showing their genealogies.

Mr. McGuire, who has published several interesting articles on the methods of chipping and rubbing stone, in the *American Anthropologist*, has become so thoroughly master of the situation in that connection that he more than intimates that European archæologists have blundered in drawing a distinction between the 'rough stone age' and the 'polished stone age;' a position with which Mr. Holmes seems to sympathize. That neither of these learned writers has ever examined a European site, seems to them of light weight, as the 'natural history method' is sufficient.

Those of a different way of thinking have not been silent. In this country such students as Prof. Henry W. Haynes, of Boston, Mr. H. C. Mercer, of Philadelphia, and Mr. Thomas Wilson, of Washington, all of whom are personally familiar with the oldest 'stations' on both continents, have condemned as narrow and inapplicable the views of Messrs. Holmes and McGuire; and in the *American Naturalist*, for December, Mr. Charles S. Read, of the British Museum, in an exhaustive article, sets forth the uncertainties which must attend conclusions based on studies limited to one field of research. In the same tone are several articles in recent issues of *L'An-*

*thropologie*. Mr. McGuire returns to the charge in the January number of the *Naturalist*, but hardly strengthens his position.

The discussion is not yet terminated. 'Replies' are announced; but at present, it must be said that the deductive and inferential method in archæology appears to be a dubious mode of procedure.

#### THE VANNIC LANGUAGE.

Most readers need not be told that the Vannic language means that which was once spoken in the region around Lake Van, in modern Armenia, by the people who called themselves Kaldi.

They came into contact with the Assyrians about 885 B. C., and adopted from them the cuneiform writing, by means of which they preserved their records in their own tongue. These have been zealously studied and collected of recent years, but without positive results. Professor Sayce maintains that the Vannic was a Georgian dialect, and has published from it various translations. Last summer, before the French Academy, M. Oppert pronounced all these translations illusory, denied that we know a single word of the tongue, and laughed at the names of the kings so seriously put forth by Sayce. The latter, however, in the *Journal of the Royal Asiatic Society* for October last, prints a bilingual inscription in good Assyrian and Vannic, where the texts correspond almost line for line, and claims in a number of examples to have proved by this confrontation the correctness of his earlier translations. He acknowledges that our defective acquaintance with the Assyrian is a difficult obstacle to a complete rendering.

The evidence that the Vannic was akin to the Georgian is, however, not increased by this bilingual text. It still remains more probable that it was either ancient Armenian, or some other long extinct Aryan dialect; possibly near to the Thracian, for

which there is a little evidence in the similarity of proper names. The point is one of considerable ethnographic importance.

#### RECENT PUBLICATIONS ON CRANIOLOGY.

Two important contributions on the Craniology of the South American Indians have recently appeared.

The first is by Dr. Ten Kate on the skulls of the Araucanians of the Argentine Republic. His material was 119 crania in the Museum of La Plata (where his paper was published). He confirms the statement quoted in my *American Race*, p. 324, that these Indians are markedly brachycephalic, 96 out of the 119 having a cephalic index above 80. The proportion of artificially deformed specimens is large, numbering about 82 per cent. They present quite diverse varieties of deformation.

Two series from Southern Argentina, in the valley of the Rio Negro, are described with his customary minuteness by Dr. R. Virchow in the Proceedings of the Berlin Anthropological Society for 1894, pp. 386-408. One series was from the base of the Cordillera, and evidently was of Araucanian origin; the other, from near the Atlantic coast, presented marked dolichocephaly and probably came from Tzoneca burials. In this article Dr. Virchow incorporates some instructive observations on artificial cranial deformities in America generally, making a useful appendix to his remarks on that subject in his *Crania Ethnica Americana*.

*The Smithsonian Miscellaneous Collections*, No. 969, just issued, is a translation of *The Varieties of the Human Species* by Giuseppe Sergi, Professor of Anthropology in the University of Rome. His method of classification is based upon the theories of craniology of which he himself is the author. Instead of multiplying, *ad infinitum*, the measurements of the skull as so many craniologists affect, he classifies according to broad outlines of cranial shape,

believing that such are far more permanent and therefore more racial than the minor variations which have engaged the attention of others. His arguments are drawn from a conscientious study of ample series from various quarters of the globe, and though some of his refinements may not be sufficiently established, the general principles he advocates merit the careful consideration of cranial specialists, as containing some new and certainly correct observations. A short prefatory note by myself introduces the author to the American public.

#### THE ARYAN CRADLE-LAND.

IF anybody thinks that the question whether the primitive Aryan horde lived in Europe or Asia has been settled, he is mistaken. Two publications of late date show that the defenders of the old theory of their central Asian origin are nowise lacking in vigorous argument.

Prof. August Boltz, of Darmstadt, in a pamphlet *Das Vedavolk in seinen Gesamtverhältnissen*, has worked out the problem of the origin and earliest migrations of the Aryans quite to his own satisfaction. He adds two maps, on which the reader can trace very clearly how they began in the great Tarim basin and about Lob Nor, and journeyed westward across the Pamir plateau, on the western slope of which they diverged, the Celtic stem wandering northwest into Europe north of the Black Sea; the Greek, Latin, Etruscan and Slavic branches by way of the Hellespont and the islands; the Iranian group remaining in Persia, while the Veda-folk or Indo-Aryans, ascended the mighty passes of the Hindu Kusch and Karakorum ranges to reach the fertile valleys to the south. These are pretty plans, but we look in vain for a substantial support to them.

Turning to Europe, M. De Nadaillac's admirable summary of the results of the investigations in the lake-dwelling of that

continent (in a contribution to the *Revue des Questions Scientifiques* for October last, entitled *Les Populations Lacustres de l'Europe*) lifts the veil as far as at present possible on European culture in neolithic times—those times when the Aryan stock began its wide wanderings. The writer inclines to their Asian origin; but with his customary frankness he acknowledges that nowhere in the debris of these ancient dwellings has there a single positive sign of Asiatic art been discovered, nor any relic such as we might suppose even a savage tribe would carry from its pristine home. Until down to a late period of prehistoric time, European culture seems to have been indigenous. For a clear and accurate summary of what it was among the lake-dwellers, the student would do well to peruse the article referred to.

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#### TCHÉBYCHEV.\*

OF Russian mathematicians, second only to Lobachévsky should be ranked Pafnutij Lvovitsch Tchébychev.

Born in Russia in 1821 and formerly professor at the University at St. Petersburg, he reached deservedly the very highest scientific honors, being privy councillor, the representative of applied mathematics in the Imperial Academy of St. Petersburg, in 1860 made member of the famous Section I.—Géométrie, of the French Académie des Sciences, and afterward *Associé étranger*, the highest honor attainable by a foreigner.

His best known work is the justly celebrated *Mémoire sur les nombres premiers*, Académie Impériale de Saint Pétersbourg, (1850), where he established the existence of limits within which the sum of the logarithms of the primes inferior to a given number must be comprised. This memoir is given in *Liouville's Journal*, 1852, pp. 366–390.

\* Deceased December 8, 1894.